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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/767,697 | 01/29/2004 | Toru Imori | Komatsu Case 267A | 5592 |

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| EXAMINER | |
|---|---|
| NOVACEK, CHRISTY L | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2822 | |

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/767,697 | IMORI ET AL. | |
| | Examiner | Art Unit | |
| | Christy L. Novacek | 2822 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/21/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

This office action is in response to the communication filed January 29, 2004.

### *Claim Objections*

Claims 6 and 7 are objected to because of the following informalities: Claims 6 and 7 are claims to the product formed by the method recited in claim 1. However, the product (a semiconductor wafer having a metal layer thereon) can be made by a different method, such as by using a chemical vapor deposition method to deposit the metal on the wafer. As is stated in MPEP section 608.01, "if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways."

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Imori (US 20020192379).

Claims 1-4, 6 and 7 are not given the benefit of the filing date of the parent application because the parent application does not disclose the claimed limitation of the pretreatment agent being acidic.

Regarding claim 1, Imori discloses preparing an acidic pretreatment agent by reacting or mixing in advance a palladium compound with a silane-coupling agent obtained by reacting an imidazole-based compound and an epoxysilane-based compound, treating the surface of an object to be plated with the pretreatment agent and then electrolessly plating the plating object (para. 0003-0014, 0023).

Regarding claims 2, 6 and 7, Imori discloses that the object may be a semiconductor wafer (para. 0042).

Regarding claim 3, Imori discloses that the electroless plating is copper or nickel plating (para. 0012).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (US 6,197,688) in view of Imori (US 20020192379).

Regarding claim 1, Simpson discloses preparing a pretreatment agent, treating the surface of an object to be plated with the pretreatment agent and then electrolessly plating the plating object (col. 2, ln. 56 – col. 3, ln. 37). Simpson discloses that the pretreatment agent may include a palladium compound, but Simpson does not disclose any particular process of forming this pretreatment agent. Like Simpson, Imori discloses a process of preparing a palladium-containing

pretreatment agent, treating the surface of an object to be plated with the pretreatment agent, and then electrolessly plating copper onto the plating object. Imori teaches that a superior acidic pretreatment agent can be formed by reacting or mixing a palladium compound with a silane-coupling agent obtained by reacting an imidazole-based compound and an epoxysilane-based compound (para. 0003-0014). This pretreatment agent allows copper to be uniformly plated on an object such that there is excellent adhesion between the two. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the pretreatment agent disclosed by Imori as the pretreatment agent of Simpson because Simpson does not disclose any particular method of forming the pretreatment agent and because Imori teaches a pretreatment agent that provides excellent adhesion between copper and the object that it is electrolessly plated onto.

Regarding claims 2, 6 and 7, Simpson discloses that the plating object is a semiconductor wafer.

Regarding claim 3, Simpson discloses that the electroless plating is copper or nickel plating.

Regarding claim 4, Simpson discloses forming a conductive layer by copper or nickel electroless plating and electroplating a copper layer onto the conductive layer (col. 3, ln. 16-50).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 4,986,848) in view of Tsuchida et al. (US 5,258,522).

Claim 5 is given the benefit of the filing date of the parent application.

Regarding claim 5, Yamamoto discloses a pretreatment agent including a solution obtained by reacting or mixing in advance a palladium compound with a silane-coupling agent

(col. 3. lines 4-37). Yamamoto discloses using an epoxysilane-based compound (glycidoxypropyltrimethoxysilane) as a silane-coupling agent but does not disclose a silane-coupling agent obtained by reacting an imidazole-based compound and an epoxysilane-based compound. Tsuchida teaches that a silane-coupling agent made by reacting an imidazole-based compound with an epoxysilane-based compound provides better adhesion and heat resistance than the epoxysilane-based compound by itself (Table 2). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the silane-coupling agent of Tsuchida in the pretreatment agent of Yamamoto because Tsuchida teaches that this silane-coupling agent provides better heat resistance and adhesive characteristics than the silane-coupling agent disclosed by Yamamoto.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN
May 11, 2005